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headings of the odd pages 181-223 inclusive, which should read "miscellaneous," not "systematic," review. The work, however, may not have been corrected in page proof.

Many teachers will find it simpler to invent their own problems, especially as no answers are here given. Students reviewing will also require answers. Let us in patience, therefore, await the time when Messrs. Baskerville and Estabrooke, having asked these many questions, may in due course answer them.

ALAN W. C. MENZIES

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Second Course in Algebra. By HERBERT E. HAWKES, WILLIAM A. LUBY, and FRANK C. TOUTON. Boston: Ginn & Co., 1911. Pp. vi+264. \$0.75.

This book was planned to review the topics treated in the author's *First Course in Algebra* and to present those additional subjects considered necessary for the best secondary schools. Though the review is brief, it covers all the essential points and gives each topic a broader treatment than was possible in a first course. There is much new material, including biographical and historical notes, graphs for purposes of illustration, problems based on geometry and physics, and some real applied problems.

As it was the desire of the authors to relieve the teacher of much of the work of explanation, the explanations are very full and there are many illustrative examples. The treatment of ratio, proportion, and variation is unusually clear and comprehensive, and it includes a good list of practical problems. The authors seem to have fulfilled their desire "to produce a text that is modern, lucid, mathematically correct, and interesting," and it can be commended to teachers who wish to use a modern but conservative textbook.

H. E. COBB

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Elements of Applied Mathematics. By HERBERT E. COBB. Boston: Ginn & Co., 1911. Pp. viii+274.

This book represents a new type of mathematical textbook for this country. It also represents the latest and best ideas and ideals in the teaching of mathematics. Whether in use the book will prove satisfactory for teachers generally can be told only by experience. Mimeographed copies of it, as stated in the preface, have been used for several years, so that presumably all its exercises have been carefully tested.

The book can be put to either of two uses: it can be employed as a regular textbook, although, consisting largely of sets of problems, it does not fit into American conditions very well for such use; or it can be used as a supplementary exercise book. We have seen the idea of the use in schools of supplementary texts in reading literature, and history grow rapidly in this country within the past quarter of a century; but the definite use of supplementary textbooks in mathematics and science may strike readers as something of a novelty. In Germany the exercise books in mathematics, of course, have a well-established place, and it is likely the trend will be toward them more and more in this country.

By cutting the first year's course in algebra here and there, and more especially by omitting the more complicated and difficult exercises—with none of the essentials suffering—the algebra can be enriched by adding to the required work the earlier

chapters, say pp. 1-90, of the present text, with a material strengthening of the pupils in algebra itself, in arithmetic, and in geometrical ideas as a preparation for geometry proper. The next hundred pages are adapted for supplementary work while the pupils are studying plane geometry, and the latter part of the book for supplementary work toward the end of the high-school course, giving a review of solid geometry and physics. The work as a whole constitutes an excellent mathematical preparation of the pupil for the actual affairs of life.

Three or four features of the book deserve special commendation: First, its use of the laboratory method, according to which the pupil himself prepares or secures the data on which his calculations are based. Much has been written of late years concerning this method, but Professor Cobb's book is the first practical means presented to us of taking this problem out of the air and putting it on a real foundation. Second, its attempt to introduce real applied problems within the pupil's grasp throughout. Third, its attempt to unify mathematics by mingling arithmetic, algebra, geometry, and trigonometry. Fourth, its training in the use of squared paper. The chapter on logarithmic squared paper is a new feature not found elsewhere in a textbook. Professor Cobb is generally recognized as the highest authority in this country on the use of squared paper, and this subject shows everywhere great care and acumen in its preparation.

The school for which the exercises were prepared is, of course, a technical school, and teachers in ordinary schools will probably find exercises here and there, possibly a considerable number, which they will prefer to omit. The large number of exercises in the book will perhaps make this necessary in any case. In most schools, also, numerous instruments and objects referred to in the text will probably have to be borrowed from the physics laboratory.

Teachers of secondary mathematics generally will do well to procure a copy of this work with a view to seeing if they can make use of it as a supplementary text, or can introduce it into some part of their course.

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